Taylor-Couette Flow between Rotating Cylinders

Problem Specification

A viscous fluid is between two concentric cylinders of radii \(a\) and \(b\), which are rotating at constant angular velocities. The diagram below shows these two cylinders and their respective angular velocities. In this problem,

\[
a = 1 \text{[m]} \quad b = 2a \quad \text{and} \quad \omega_2 = 0 \text{[rad/s]}
\]

but the velocity of the inner wall must be calculated to create the Taylor-Couette phenomenon. Find the velocity vectors that are characteristic of the Taylor-Couette flow.